

KRAMER PALOUSE NATURAL AREA

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ABSTRACT.— The 27-acre Kramer Palouse Natural Area located in southeastern Washington State represents the best remaining example of what was once the most productive portion of the original Palouse Prairie. This area is being maintained in its pristine condition as a key to the past and as a memory to a unique and once extensive prairie land by the Department of Forestry and Range Management at Washington State University.

Many of the most productive rangelands of the past are now agricultural lands. The Palouse Prairie of the inland Pacific Northwest is no exception. Once part of a vast prairie-land that extended throughout eastern Washington and Oregon, as well as adjacent Idaho, most of this region has since been turned under by the plow, to become some of the most productive unirrigated farmland in the world.

The Palouse Prairie occupies a region of relatively gentle topography, with the principal relief being low hills having the general appearance of dunes. These wind-deposited loessal materials originated in the arid lands and volcanoes to the west, and were deposited on a basalt rock foundation. Fertile xerolls of silty and clay loam texture have developed under the influence of a semiarid climate. Average annual precipitation is from about 400 to 600 mm (16–24 inches), coming mostly as rain or snow during fall, winter, and spring. Prefarming era vegetation was characteristic of a true grassland region, and was composed of dense stands of caespitose perennial grass species (Daubenmire 1970).

The climax vegetation, though palatable and nutritious, apparently developed without significant grazing use. Dominant species are easily injured by close cropping, and under poor grazing management are replaced by introduced annual grasses (chiefly *Bromus tectorum*). Archeologists estimate that the small bison population of the region became extinct about 2,000 years ago, and large herbivore grazing was practically nil from that time until horses from early Spanish missions

of the southwest were introduced in about 1730 (Osborne 1953). The region is so remarkably adapted to intensive wheat and pea cropping that today livestock grazing never has become an important land use, except in waste places.

With the development of a side-hill combine and other technologically advanced farm equipment, only the very steepest “eyebrows” and slopes of the loessal deposits of the Palouse have not been tilled. Many of these small islands of native prairie have been used for other purposes and have changed dramatically over the past. Most remaining uncultivated segments are so small as to have been changed to dense stands of brush or weeds through activities on adjacent land including tillage, herbicide applications, and fertilization.

Probably the best remaining example of the more productive portions of this region is the Kramer Palouse Natural Area. Ownership has been obtained by Washington State University in an effort to retain this unique specimen in its natural condition as a reference point to the past for demonstration and research.

HISTORICAL BACKGROUND

The 27-acre Kramer Palouse Natural Area was once part of a producing wheat farm, but it was held out of production by virtue of steep topography and shape of the ownership boundaries of the farm. It reaches over the crest of a high ridge, too steep for even the intrepid Palouse area farmers to cultivate.

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The ownership boundaries included the steepest part of the ridge top, with neighbors on three sides, and no access to the back side without crossing their land. Consequently, the area was not plowed until 1961 when the owner decided to cultivate the lower northern extent of the parcel. However, after having made one pass with the plow, the farmer says he didn't have the heart to continue and left the tract untouched by further disturbance. The path of that one pass, half-circle in shape along the base of the ridge, can still be faintly seen today, but the vegetation is now similar to adjacent sites.

The area was occasionally used as a pasture for farm milk cows, but only a small part was noticeably changed where the cattle congregated for resting. A road that once traversed the area for movement of farm equipment and animals is the most evident scar of disturbance from the past, but even this has healed over with native vegetation similar to the undisturbed portions.

Dr. Rexford F. Daubenmire is reported to have found the area in about 1955 during his search for bench mark natural areas in support of his ecological studies. He established permanent study plots there at that time and continued to make observations as needed. He later showed the area to Dr. Grant A. Harris, who pursued the possibility of purchasing the tract through John P. Nagle, then chairman of the Department of Forestry and Range Management at Washington State University. The parcel, previously owned by Caroline Kramer, was not immediately available for purchase. However, following probate settlements for the Kramer estate, the University was able to purchase the 27-acre tract. The deed was filed in the university's name on 28 March 1962. The Department of Forestry and Range Management, with specific assignment to Dr. Harris, was given the responsibility for administration and maintenance of the Natural Area, and this assignment continues at present.

Description

The Kramer Palouse Natural Area, 27 acres in size, is located about 5 miles west of the farming community of Colton, Whitman County, in the southeastern portion of the

state of Washington (N $\frac{3}{4}$, SE $\frac{1}{4}$, NE $\frac{1}{4}$ of Section 25, Township 13 North, Range 44 East, WPM). Aspects are generally steep on the south and north, with elevations of 805 to 869 m. Precipitation at the site averages approximately 550 mm (22 inches) annually.

Zonal vegetation in this environment is expressed in the *Festuca idahoensis*/*Symphoricarpos albus* association (Daubenmire 1970). A major part of the north slopes of the Natural Area supports this habitat type. Major species include the caespitose grasses, Idaho fescue (*Festuca idahoensis*), bluebunch wheatgrass (*Agropyron spicatum*), and June grass (*Koeleria cristata*), in association with shrubs dominated by snowberry (*Symphoricarpos albus*) and wild rose (*Rosa nutkana* and *Rosa woodsii*). The type has a rich diversity of perennial forbs, creating a virtual sea of flowers across the Natural Area during much of the growing season. The snow-catching boundary fences along the north slope have sufficiently altered the microclimate in places to increase the normal coverage of the tall shrub phase (*Symphoricarpos*), creating a border of dense shrubs including chokecherry (*Prunus virginiana*) and occasionally bittercherry (*Prunus emarginata*). There are also small patches of the black hawthorn/cow parsnip (*Crataegus douglassii*/*Heracleum lanatum*) habitat type at the base of the steep north slopes, typical of bottom lands that are more moist than local zonal soils. The south face of the Natural Area supports a topographic climax cover of the bluebunch wheatgrass/Sandberg's bluegrass (*Agropyron spicatum*/*Poa sandbergii*) habitat type typical of the more droughty vegetation zone to the west.

Detailed soil and vegetation studies by Aller et al. (1981) on the site have revealed a "perched water table" situation in the solid steep north exposures. On this site, as well as two other similar locations, they found an undescribed topoedaphic climax plant association dominated by *Carex geyeri*, as well as a *Festuca* phase and *Symphoricarpos* phase of Daubenmire's *Festuca idahoensis*/*Symphoricarpos albus* association that had not previously been reported.

Soils on the site have been classified into the Palouse and Calouse series, which are relatively deep, well-drained soils that formed

in loess deposits containing varying amounts of volcanic ash (Donaldson 1980). Approximately 80 percent of the surface is classified as Palouse-Thatuna silt loam, 10 percent Palouse silt loam (SE corner), and 10 percent Calouse silt loam (SW corner). The Palouse-Thatuna series is a complex of approximately 50 percent Palouse and 50 percent Thatuna silt loam, mapped together because of their intermingled occurrence in the field. The Palouse silt loams are generally found on convex slopes and Thatuna on concave slopes, examples of which are found on south and north exposures of the natural area, respectively. All the soils found there are deep, well-drained, and fertile, and, in cultivation, produce excellent crops of wheat, lentils, peas, barley, and alfalfa.

An abundance of wildlife inhabits the area, including coyotes, badgers, and occasionally whitetail deer.

Management philosophy encourages non-destructive scientific study of entire ecosystems found in the Natural Area. Scientists from several university departments, including the Universities of Idaho and Washington, as well as from state and federal agencies, have established short-term biological studies there. In addition to vegetation, studies have investigated natural status of soils, rodents, insects, birds, and atmosphere, all in considerable detail. Interest in the Palouse Natural Area as a bridge to the past continues to increase as research interest in biological subjects increases, and the area will become ever more valuable as time passes.

Access to the Natural Area is somewhat hampered because it is isolated from the local road system and is completely surrounded by cultivated land. The lack of easy access, however, simplifies maintenance of the undisturbed characteristics of the area. Arrangements have been made with the neighbor on the west to walk one-half mile along his fence line southward from Rim Road near its junction with the Colton-Wawawai Road. This provides the principle access for observation and study.

MANAGEMENT PROBLEMS

Maintaining a natural area in its natural state, especially one as small as the Kramer

Area, is not easy. Most of the problems stem from the "unnatural" interface of the area with adjacent cultivated farmland.

There is some indication that the dense cover of tall shrubs that has developed along some of the fence lines is migrating inward and increasing its extent over the area. The potential loss of the grass-forb- and low-shrub-dominated communities may become a concern in the future.

Because of good cover and protection provided by the shrubs along the fence line, and because of availability of adjacent cultivated crops as forage, the population of Columbian ground squirrels (*Citellus columbianus*) has increased dramatically around the perimeter of the track. In the past, these rodents have stripped adjacent field crops as far as 100 feet out from the boundary. Following complaints from neighboring farmers, attempts were made to control excessive populations of the squirrels, but most methods considered or tried proved to be either largely unsuccessful or involved equipment that was difficult to get to the inaccessible area or that would cause undue disturbance. Recently, however, a very successful control effort has been implemented using a product with the trade name "Ramik Green," made by Velsicol Chemical Corporation. This rodenticide was placed in bait stations located around the perimeter of the area during early spring. The immediate question that has been raised is whether or not this control of rodents changes the natural balance of the ecosystem. It is our opinion that rodent populations prior to control were artificially high due to the adjacent crops as a forage source. No attempt has been made to completely destroy rodent populations, with control efforts directed only at critical locations around the perimeter of the Natural Area. The alternative, legal action taken by neighboring farmers due to obvious crop damage, would clearly endanger the status of the Natural Area.

Another problem of the intensive agriculture interface is herbicide drift from adjacent fields, primarily 2-4-D. The most obvious impact is damage to shrubs along the boundaries. What changes in species composition herbicide drift causes is unknown at this time, but it does not appear to be a serious problem as far as maintaining natural conditions over most of the area.

Except for cheatgrass (*Bromus tectorum*) along the ridge top, noxious, introduced weeds now common to the region have largely been excluded from the unit by the well-established stands of native vegetation. Canada thistle (*Cirsium arvense*) has appeared in a couple of places and could possibly become a problem to deal with in the future.

Research use is encouraged, but care is taken to limit the kinds of uses to those that can be made without significant disturbance to its natural character. A system of approval has developed in which the applicant submits a copy of a detailed proposal for review by the administrator. If destructive procedures are found, negotiations usually modify these so that the work can be completed. Visits by undergraduate classes are not encouraged.

Due to limited access to the Natural Area, disturbance by the general public has not been a problem. Public use has been limited primarily to upland game-bird hunters.

LITERATURE CITED

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